EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1958

IN THE MATTER OF: Case No. 1364

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
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IN THE MATTER OF: Application of Cities Service Oil Company for an oil-oil dual completion in the Vacuum Pool and Vacuum-Seven Rivers Pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State "K" No. 2 Well located 1980 feet from the North line and 660 feet from the East line of Section 27, Township 17 South, Range 35 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Vacuum Pool through one inch tubing and oil from the Vacuum-Seven Rivers Pool through two inch tubing.	Case 1364

BEFORE: Mr. Daniel S. Nutter, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: The next case will be Case 1364.

MR. COOLEY: Application of Cities Service Oil Company for an oil-oil dual completion in the Vacuum Pool and Vacuum-Seven Rivers Pool in Lea County, New Mexico.

MR. HOLL: Alfred O. Holl, appearing for the applicant, Cities Service Oil Company. We have one witness.

(Witness sworn.)

E. F. MOTTER,

a witness, of lawful age, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

By MR. HOLL:

Q Would you state your name and address, please?

A E. F. Motter, Hobbs, New Mexico.

Q By whom are you employed and in what capacity?

A Cities Service Oil Company, District Petroleum Engineer.

Q Have you previously testified before this Commission as an expert in matters such as this cause?

A Yes.

MR. HOLL: If no objection, we will ask that the witness's qualifications be waived.

MR. NUTTER: The witness is qualified.

Q Are you familiar with the application in this cause, Mr. Motter?

A Yes, I filed the application myself.

Q Is the well which is the subject of this application under your direct supervision and direction?

A Yes, it is.

Q Would you explain to the Commission the purpose of this application?

A Well, this application is to allow dual completion of the Cities Service State "K" No. 2, located 1980 feet from the north line, 660 feet from the east line, in Section 27, Township 17 South, Range 35 East, Lea County, New Mexico. This well is currently producing from the San Andres formation and we wish to dual the well

so as to produce from both the San Andres and Yates formation.

(Cities Service Exhibit "A" marked for identification.)

Q I hand you what has been marked as Exhibit "A" by the reporter, and ask you to identify and explain it when the Examiner has a copy.

MR. NUTTER: Just one moment. The well in question is the State "K" No. 2?

A Yes, that is correct.

MR. NUTTER: The original application filed for this hearing was for the State "K" No. 1?

A That's right.

MR. NUTTER: But the well to be dually completed was changed by a letter of amendment?

A December 18th we asked that it be changed. I will make reference to that later in my testimony.

Exhibit "A" is a plat of the area in question showing the Cities Service State "K" lease, the offset producing wells, the offset operators. I might point out that all these wells that are numbered and do not have a dash under the number are San Andres wells. Those wells which are numbered and have a dash under them are Vacuum-Seven Rivers wells, and I had better explain that. That I believe right now is being listed in the proration schedule as Vacuum-Seven Rivers Pool, but it is my understanding that will be changed to Yates.

Q Have you performed any tests to determine if this State "K" No. 2 is oil productive in the Yates formation?

A No, sir, but if you will again notice Exhibit "A", there are some seven or eight wells now producing from the Yates formation in that immediate area.

Q Now why did you choose to dually complete the State "K" No. 2 rather than the State "K" No. 1, which is offset by a Yates producer?

A We believe there is a better chance for an oil completion with a low gas-oil ratio in the Yates formation in the State "K" No. 2 than in the State "K" No. 1. Again referring to Exhibit "A" the Standard of Texas State "4-27" well No. 6, which is a south offset to our "K" No. 1, has a high gas-oil ratio and the well, the No. 7 well, which is a west offset to that, or a diagonal, southwest diagonal offset to State "K" No. 1, has produced no oil to date, and I think the latest test is about 13 MCF of gas.

MR. NUTTER: Which well is that?

A Standard of Texas State "4-27" No. 7; that would be located in the Northeast Quarter of the Southwest Quarter. We have it shown as a location. That well has actually been tested.

MR. NUTTER: As a gas well?

A No oil has been produced, we will put it that way. I wouldn't hardly consider 13 MCF a gas well, but I think perhaps they will continue working on that well. We prefer to attempt this dual completion on the State "K" 2; our next exhibit will bear out a

little more why we desire that. If the State "K" 2 is successful, we will probably -- I shouldn't say if it is successful, if the Commission approves and it is successful, we will probably approach the Commission again to dual the State "K" No. 1.

(Cities Service Exhibit "B" marked for identification.)

Q I hand you what has been marked as Exhibit "B" by the reporter and will ask you to identify and explain that exhibit.

A Exhibit "B" is a contour map on top of the Seven Rivers, formation in this area. The pay section is in the base of the Yates, as we define it, so for convenience and picks of logs we contoured this on top of the Seven Rivers, and as I explained previously, I believe that the proration schedule, as I understand it, is to be changed to Vacuum-Yates quite soon.

MR. NUTTER: At this point, let's clear the record on the Seven Rivers and Yates. At the Commission hearing on December 18, testimony was presented that the formation in which these wells in the area in question, that these wells were completed in the Yates formation which originally had been thought to be the Seven Rivers, but additional geological information reveals that this is the Yates formation for this pool; and it has been redesignated as the Vacuum-Yates Pool.

A Thank you. I didn't know it had been redesignated as yet. We will refer to it from here on in as the Vacuum-Yates Pool. This contour map will substantiate our reasons for attempting a dual

completion in the Yates formation State"K" 2 rather than the No. 1. I think you can see quite clearly that it will probably be some twelve or thirteen feet lower than the No. 1 well. We think that we can make a lower gas-oil ratio oil well in the "K" 2 than on the "K" 1.

Q Do you have a Gamma Ray-Neutron log for the Examiner?

A Yes, we have a Gamma Ray-Neutron log.

(Cities Service Exhibit No. "C" marked for identification.)

A It has been marked Exhibit "C", and we have marked the tops of the various pays, San Andres, and on a five-inch scale we have marked the top of the Seven Rivers, and also where we will probably attempt a completion if this case is allowed. I do not say those will be the exact perforations, but they will probably be in that area. Also this has the top of the San Andres formation located down at minus 430, which shows what the other pay formation is.

Q Now have these two reservoirs for which you plan the dual completion been separated behind the casing?

A Well, five and a half inch casing was run to 4192 feet and cemented with 150 sacks, which was not enough to cover the Yates formation. We plan to perforate and squeeze the formation below the Yates pay to separate perforation between the two producing zones.

Q Do you feel that there might be migration of fluids between the San Andres and the Yates?

A No, the San Andres is adequately protected to prevent any upward movement of fluid, in my opinion.

Q What is the remainder of the casing program for the State "K" No. 2, other than the five and a half inch casing?

A Eight and five-eighths inch casing is set at 1650 feet with 350 sacks of cement.

Q Are all the fresh water zones adequately protected?

A Yes, they are.

Q Will you describe the procedure for dualling a well, and referring to Exhibit "D", which we will ask the reporter to mark, please?

(Cities Service Exhibit No. "D" marked for identification.)

A Well, I should explain this exhibit is the proposed method of dual completion; however, before we can do this, we must determine whether the Yates is productive, and I will explain how we plan to do that. We plan to set a drillable bridge plug at approximately 3200 feet, perforate and squeeze the Yates formation, drill out the cement, perforate and test the Yates formation. If the Yates is found productive, the bridge plug will be drilled and a Baker Model "DA" production packer will be set at approximately 4150 feet. This packer will separate the two zones of production at all times. Two inch tubing will be run from the Model "DA" packer up to the wellhead. A crossover assembly will be made up of two inch tubing at approximately 3,050 feet. I think we show it 3,060,

somewhere in that neighborhood. A one inch tubing string will be run from the crossover assembly up to the wellhead. Production from the lower zone will enter the two inch tubing string, will come up to the crossover assembly, and enter the one inch tubing onto the surface. The production from the upper zone will enter the crossover assembly and proceed up the two inch tubing to the surface.

Q Now you say that both these zones will be pumped. How will this be accomplished?

A We have prepared, I believe it is Exhibit "E" that I have up here on the wall. I have copies, but I will be glad to attempt an explanation of that.

MR. HOLL: We will ask the reporter to mark this as Exhibit "E".

(Cities Service Exhibit No. "E" marked for identification.)

A This I should explain first is a two-zone pump method on a single rod string starting at the very lowest; here, this will be our Model "DA" production packer. This will be our lower zone pump. You will notice a vent tube around the side of the lower zone pump; this vent tube is so designed, with this check valve arrangement here, that any gas will be vented up above the pump to prevent gas locking of the lower pump. As we proceed on up the assembly, this assembly right in here latches the back of the assembly between the two pumps in place. There is actually a polish rod with a packing element to prevent fluid from entering the upper zone production.

The fluid from the bottom zone will come up this pump on up to the one inch tubing to the surface. The production from the upper zone will enter through the crossover assembly right below the barrel of the upper pump on through the two inch tubing through the surface. If there are any other questions I will refer to it later, or you can ask it now.

Before I go on, I might say that bottom hole pressure, if ever needed, can be taken, of course, with this assembly we can pull both pumps, and the latching device that holds the pack-off element in place between the two pumps is so designed that wire line equipment can be used and plugs set in there to take bottom hole pressure. The back-off tool would allow pressures to be taken on the upper, and straight-through tool would allow the pressure to be taken on the bottom zone. I might further tell the Examiner that in case we ever had to pull the pump and leave it out of the hole for some time, we would no doubt run a wire line equipment to separate the two zones so that they would not commingle.

I believe I explained most of this process of taking bottom hole pressures in a previous application that we had on Cities Service State "P" No. 2 well. This is identical equipment, except we are using the two pumps on a single rod string.

Q In your opinion, is this installation in accordance with good engineering practices and principles?

A Yes, and I might add that we have several installations very typical of this now producing or pumping in the Goldsmith Field

in Ector County, Texas. They have been quite successful. We think that this is pretty good equipment for this type of work, when you are limited to using only one string of two inch tubing, since we have only five and a half inch casing in place.

Q I assume this technique has been recognized and accepted in general by the oil industry and other State regulatory bodies?

A Yes, it has. As I explained, we are using it over in Texas now.

Q Do you think that corrosion will be any factor in this?

A Well, we have very little evidence of corrosion in the San Andres right now. No corrosion has made itself, or has appeared on our down hole equipment, and we do not believe the Yates formation to be corrosive either.

Q Do you feel that this method of dual completion will present any more possibility of leakage or communication of reservoirs than other accepted methods?

A No, sir, I do not.

Q If this application is approved, will you be willing to take proper leakage tests?

A Yes.

Q Packer leakage tests?

A Packer leakage tests, yes.

Q Do you have bottom hole pressures on these two zones?

A Yes, sir, we just ran a bottom hole pressure on the State "K" No. 2. We found that to be 788 pounds per square inch, and one

of the operators has reported to us a pressure of 1711 pounds on the Yates formation. I checked with the same operator a couple of times on that. That seems to be right. He has a shut-in pressure of some seven hundred pounds on the surface. That particular well is flowing, but a couple of offsets are pumping, so it may be high. I don't know whether it is a local condition or what it is, but it seems to me like it is pretty high for that depth of production.

Q How much differential pressure will occur in the packer?

A You mean across the packer?

Q Across the packer.

A Approximately 1400 pounds.

Q Do you believe that this packer will adequately handle that differential pressure?

A Yes, I certainly do.

Q Do you have the gravities of the oil in the two formations?

A 37.6 degrees API on the San Andres, and the Yates is 36 degrees API. The gravity on the Yates was taken from the forms filed with the Commission office in Hobbs.

Q Will this production be separately tanked and gauged?

A Yes.

Q To surface?

A Yes, it will.

Q With two pumps on a single rod string, what do you propose if one zone has produced its allowable before the end of the month and the other zone is under its allowable at the same time?

A Fortunately, both of these zones fall in the depth limit of less than five thousand feet so they'll have the same allowable. What is normally done in this case is that the bottom pump naturally is smaller than the upper pump. However, the upper pump taking out your displacement for your rod going down to your bottom pump will not have its full producing capacity, even though it will probably be some quarter or half inch larger. In case the upper zone production exceeds the bottom zone, all we do is turn the production into the annulus and circulte it until the two zones are in balance.

Q Do you prefer to dually complete this State "K" No. 2, rather than drill a singly completed well in the same forty acre tract to the Seven Rivers formation?

A Yes, we certainly do.

Q What is your reason for this?

A We have watched performances of the wells that have been completed in the Yates and have found that some of them had to go on the pump pretty fast, and we have enough core and log data to make some type of recovery preduction. We believe that the cost of a single completion is not justified at this time.

Q Have you prepared estimates on the cost of single completion?

A Yes, sir, we have made an estimate and have conferred with other operators in the area on the cost of drilling a well to the Yates formation. Our estimate agrees very well with the actual costs by several other operators. We have prepared an exhibit on the cost of a single completion.

MR. HOLL: This will be Exhibit No. "F".

(Cities Service Exhibit No. "F" marked for identification.)

MR. HOLL: And also Exhibit "G" and Exhibit "H".

(Cities Service Exhibits No. "G" & "H" marked for identification.)

Q Would you explain these three exhibits, Mr. Motter?

A Well, Exhibit "F", of course, is the cost of drilling a singly completed well to the Seven Rivers. I said, I referred to the Yates, we probably will have to go to the Seven Rivers. That total is $47,336.00.

Exhibit "G" is our estimate of a dual completion to the same zone employing this equipment that we have shown, and we estimate that to be $26,694.00, or the cost of a dual will be $20,642.00 less than the single completion.

Q Have you calculated any reserve estimates of these formations?

A Yes, one operator in the field has cored, I believe, four wells, and we have used their reservoir analysis on these cores and compared the logs on those same wells to the Cities Service State "K" No. 2 log. The pay section as shown by the logs compared quite favorably, but the Cities Service State "K" 2 well has about two or three feet less net pay than the wells on which we have core analysis. By using the average recoverable oil as indicated by core analysis and net feet of pay from the Gamma Ray-Neutron Log on State "K" No. 2, I have estimated a gross recoverable oil to be 35,000 barrels. Past performance of wells recently completed indicates

this to be slightly high, and I have checked with some other operators. I believe they are giving that estimate or perhaps just a little bit lower. I have, on Exhibit "H", down at the bottom there, shown how I arrived at that 35,000 barrels.

Q And you have made a comparison of the two types of completion as to cost, net profit and payout?

A Yes. If you will refer to Exhibit "H", we have shown, starting at the top, of course, we have a gross recoverable oil will be the same for both the single and dual, and net oil will be the same. Earnings the same, operating expense for the single completion we have at fifty cents per net barrel, which is $15,305.00; for the dual we have indicated ten cents per barrel more which increases that some $3,000.00. We take out taxes and show our net earnings with a payout of one hundred forty-three percent on the single, as compared to two hundred forty-two percent on the dual. If we had left the cost of operating for the dual the same as the single, which we could very easily do, the two still show a better payout on the dual by some ten or fifteen percent.

Q Now, were these Exhibits "A" through "H" prepared by you or under your supervision?

A Yes, they were.

MR. HOLL: We ask the admission of Exhibits "A" through "H".

MR. NUTTER: Is there objection to introduction of Exhibits, Cities Service Exhibits "A" through "H"? If not, they will be

received.

MR. HOLL: That's all we have.

MR. NUTTER: Anyone have any questions of Mr. Motter? Mr. Utz.

CROSS EXAMINATION

By MR. UTZ:

Q Mr. Motter, ordinarily in dual completions we have only one possibility of commingling between zones, and that is through the packer, is that right?

A Yes.

Q On this setup we have two?

A Yes, I believe, as I explained before, if we pull that pump for any length of time we could have commingling there.

Q Do you know, or have the people that supply this equipment to you given you any idea of how effective the seal is on the pump shaft between the two formations, the polished rod and the packer assembly?

A Well, they, of course, tell us that it is nothing but the best. We have looked it over and we think it is satisfactory, and see no reason why it will not serve the purpose for what we intend to do.

Q It is my understanding that on a pumping well they have considerable packer trouble at the surface. It is not uncommon that they have to replace those packers quite frequently, am I correct?

A I believe you are referring to a stuffing box, is that right?

Q That's right.

A Yes, that is very true. I think, though, that on this particular installation the polish rod here will be oil wet on both sides of the packing assembly, whereas on the surface you have, it will be oil wet on only one side, and therefore I think you'll have a less chance for leakage or your packing should be lubricated as your polish rod travels through your packing from one side to the other. I think that that is a chevron-type packing which, as the pressure increases, it is supposed to pack off more extensively.

Q If that packer should fail, how would you detect the commingling between zones?

A Well, we have, of course, a difference in gravities would be the main protection.

Q The difference in gravities?

A Yes.

Q Do you plan to take gravities frequently?

A Well, every tank will have to have a gravity taken on it as it is sold. We will have that each time.

Q I believe you stated that if the upper zone produced its allowable sooner than the lower zone, you would recirculate the upper zone production through the annulus?

A Yes.

Q If the lower zone produced its allowable first, what would you do?

A If the lower zone produced its allowable first, what we

would have to do in that case would be to change the size of the pumps, so that the lower zone pump would be much smaller. In other words, that would be something that we would have to work out for the next month's production. In other words, we would attempt to make the lower zone production slightly less than the upper zone.

Q By that method you would stay within the 125 percent tolerance?

A Yes, we should be able to quite easily.

Q Can you tell me what the minimum restriction is in your crossover assembly?

A I believe that the seating assembly will allow 125 - 30 seconds is the idea of that. Is that what you have reference to?

Q I had reference to the restriction of the oil flowing through the crossover assembly.

A Well, let me refer to this drawing.

Q What size orifice?

A There will be some restrictions; this, of course, is a cutaway. This has ports to allow the fluid to go through there. I don't know exactly what size those ports are, but they, I'm quite positive, are greater than the area of the one inch tubing.

Q You think they are?

A Yes, I'm quite sure.

MR. UTZ: That's all the questions I have.

MR. NUTTER: Anyone have any further questions of Mr. Motter?

By MR. NUTTER:

Q Mr. Motter, you stated that gravity of the San Andres is 37.6, and the gravity of the Yates oil is 36?

A Yes, that's right.

Q What is the GOR in the San Andres formation?

A The GOR, I believe is around 1300 to one.

Q What do you anticipate as a GOR in your State No. 2 in the Yates?

A That is going to be real hard to say right now. As I told you, we have this well down here, a Standard of Texas, No. 6, that is a fairly high GOR. I think that the production is not great enough that it is a penalized allowable, but I would say roughly that the Yates GOR, if we get wells comparable to those that Magnolia has down south, it will probably be in the neighborhood of one thousand to one.

Q So there won't be any material difference between the GOR's in the Yates and the San Andres formation, will there?

A Well, you might say about four hundred cubic feet per barrel, something like that.

Q Is the Yates oil a corrosive oil or sweet oil or what?

A I believe it is considered sour crude, but as far as corrosion effect on equipment, I find no trouble.

Q This polish rod, that operates through that packer that separates the two zones, is a corrosion resistant polish rod?

A You can buy those either way you want. It can be stainless

monelitic metal you need.

Q Would you install a polish rod that would be resistant to corrosion?

A We would, it probably would be a high nickel or some type of rod like that.

Q Has Cities Service had experience operating this type of pump?

A Yes, down in the Goldsmith Field, I believe we have four operating that the lower zone is producing from 7100 and the upper zone from about 3,000. They're working just mighty fine.

Q Is that in an area where the oils are corrosive oils?

A Well, I should say no, it would be Permian Basin crude, probably considered a sour crude, but I would say they are not corrosive.

Q Has Cities Service experienced any problems at all as far as leakage through the packer or through the packing element that separates the two zones?

A To date, I probably should qualify myself, this is not in my area, it is in another district, but we have had none reported to us. Normally anything of that nature, new equipment, if we find failures or have trouble, we try to circulate the information immediately, and none has been reported to me at all.

Q You couldn't state that they haven't had any trouble?

A No, I have had some communication from the engineers whose area this is in, and as I say, they are more than satisfied or quite

satisfied with the hookup.

Q Are the allowables in the two zones over there in Texas equal to each other as they would be here?

A No, I think there is some difference because that is quite a difference in depth, from 3,000 to 7100. I'm not sure what the allowables are, but I can reasonably say that they should be some greater at the 7100 than the 3,000.

Q Have the engineers been able to size the pumps so that the two zones make their allowables at the same time?

A Yes, we can size the pumps. We can go on the bottom there up to, I believe, an inch and three quarters. Of course, the upper pump can be the same size as the tubing, it can be a full two inch pump.

Q So by sizing the pump, you can approximate the exact allowable in each zone at the same time?

A One thing I should point out here, this polish rod that comes on down through here, you realize that when the pump is in a down stroke, this area of the polish rod is always taken out of the displacement, whereas down here so, there is some difference in the two there. So even though this is a bigger pump, it may not produce as much as this lower pump.

Q What about the Vacuum Pool there in the San Andres formation, does that make any paraffine?

A Yes, that makes some paraffine; I checked the records of these wells that we have producing, those four wells, and I don't

believe we have cut any paraffines out there or had pulled the wells for a period, it seems to me like three years. I might add that we have included in the cost of this dual, let's see, plastic coating, 3350 feet of one inch tubing, which the reason we are doing that is for paraffine control.

Q You believe that plastic coating, this one inch tubing, will eliminate the paraffine problem there?

A Yes, we do.

Q Mr. Motter, your Exhibit No. "H", I follow you down to the point where the single completion will have a net earnings of $67,000.00 and the dual completion will have a net earnings of $64,000.00. The two development expenses are taken off of Exhibits "F" and "G"?

A That is correct.

Q I don't follow the net profit for the two types of completions.

A I see we have an error here. That should be $20,154.00 instead of $30,000.00. Maybe we should correct that for the record.

Q I don't think it is $20,154.00.

A Let me go back through here. I believe I can explain that. Oh, pardon me, that is correct. That 47,000 should come off of the -- that's right, it should be $20,154.00.

Q Is that a direct subtraction of 47,000 from 67?

A Should be. There must be an error. It should be $20,314.00, I guess. I don't have a slide rule with me. Do you have one there to see if that percentage is the same?

Q No, I haven't.

A Actually it would cut it down lower.

Q In other words, the correction of this error makes the dual completion more attractive than you thought?

A Yes, that is correct.

Q What's the present productivity of these wells of yours in the Vacuum Pool?

A Those wells are all producing top allowable, those San Andres wells.

Q All top?

A Yes, I have some recent tests, I think two of them are capable of producing eighty or ninety barrels; the other, some in the neighborhood of fifty.

Q What has been the producing history in the Yates Pool?

A We don't have too much history. The wells have only been completed three or four months.

Q How many wells have been completed at the present time?

A I believe Magnolia has four wells down there, referring to this exhibit, that is in the Northwest Quarter of Section 34. I do not believe that No. 8 is producing at the present time. Standard of Texas has two wells producing in the West Half of the Southeast Quarter, that is No. 5 and 6, as I stated previously; they are doing some work on No. 7; No. 8 has been reported as a location, I do not know whether that well has been drilled as yet or not.

Q Magnolia's wells in Section 34, are they producing top

allowables?

A Yes, one of the wells is flowing, and I believe that No. 6 is a flowing well, and the other two wells are pumpers. They are all producing top allowable.

Q Producing top allowable?

A No, let me take that back. One is only making thirty-three barrels.

Q How about Standard's wells there in Section 27?

A No. 5 is, I don't know what that particular well is making. No. 6 is only making some thirteen or fourteen barrels a day.

Q You don't believe that the producing history of these wells plus the anticipated future of them justifies a single completion?

A No, I certainly don't. We know that some of the wells are on a pump now, I believe that our exhibits pretty much bear that out. I have talked to engineers of some of the other companies that operate down there, and they tell me that they have estimated about this same recovery, but they stated also they thought they were high. You notice I estimated the primary recovery at twenty percent. I talked to Core Laboratories about that, they made the analysis on the cores, and they seem to think that figure is probably pretty close.

Q Now back to your Exhibit No. "H", Mr. Motter. I note that you show operating expenses ten cents a barrel higher for the dual completion than for the single?

A Yes.

Q Why do you expect the operating expenses to be higher?

A We did that because we thought that perhaps with two pumps in there, we thought we might have more trouble, we might have to pull it; we might have to pull it more often than a single completion.

Q By having a higher operating expense, you would probably reach the economic limits sooner, wouldn't you, on the well?

A Yes. I might explain another thing. Of course, that is brought out also on the single completion. On a dual we can use the surface pumping equipment that is in place right now, whereas we would have to buy an additional pumping unit for the single completed well.

Q But with higher operating expense, you would reach the economic limits sooner?

A Yes.

Q In other words, you wouldn't have the same amount of oil recovered from a dual that you would from a single, would you?

A I will put it this way; we will reach the economic limits sooner, but our development expense would be so much less that we consider this is the best method to attempt this completion.

Q But by reaching the economic limits sooner, you would have to abandon the well sooner?

A Yes, that would be true.

Q Yet you have shown the same amount of gross recoverable oil and net recoverable oil from the two projects?

A Maybe I should go back to my previous statement. I think

we said that we do not know they will be ten cents higher. We went ahead and called it ten cents, but we did show the same net recoverable oil in both cases. The economic limit may enter in there and knock off a few thousand barrels.

Q Do you think that the difference in gravity of 1.6 degrees is sufficient to note a leak, should a leak occur?

A I believe that unless a leak is very minute that we could do that. Of course, we can always go in there and run bottom hole pressures to determine if there is any communication between the two zones,or check the packer.

Q One more question, Mr. Motter. You stated that you were going to plastic coat your one inch tubing?

A Yes.

Q Do you think that this intricate system of pumps and cross-over will present any problem as far as paraffine is concerned?

A It possibly could, but we can go ahead and pull the rod string and cut the paraffine on the two inch easily, and cut down to the bottom pump or where the lower pump is seated, in case it gives us trouble. As I stated previously, the San Andres on this particular lease, we have produced those wells for three years without pulling the pumps, so we do have paraffine trouble, I'll say that, but we have operated that long without having --

Q (Interrupting) Do you use any solvent or anything?

A No, we are not, and it would be impossible to use solvents on the bottom zone with the particular hookup. We do use scrapers

out there.

Q Now, Mr. Motter, in your honest opinion, do you believe that any oil will be lost by dually completing this well as a result of higher operating expenses or running into paraffine problems or such things as that?

A Let me do a bit of quick figuring. If it is $3,000.00 more to operate the dual, that would be, say, roughly $2.00 a barrel, that would be what, about 1500 barrels that we might not recover in the dual rather than over a single completion, which wouldn't be adequate, I don't think.

Q How much additional earnings would Cities Service have by this?

A We would have, according to this we would have about $17,000.00 or close to $18,000.00 additional earnings by the dual rather than the single completion.

MR. NUTTER: Does anyone have any further questions of Mr. Motter? Mr. Utz.

By MR. UTZ:

Q You said that you had some of these units in operation in the Goldsmith Field?

A Yes.

Q How many do you have?

A There are four. Right now we have six installations, but there are only four that have the two dual pumps on a single rod string. I think the other two wells, they still have one zone

flowing and the other zone is on one pump.

Q How long have you had these units installed?

A They have been in, I would say, about six months now.

Q You don't have much history on them yet?

A No. I might add here, while we are talking about this, our Hobbs office is a division office also, and that is under the direct supervision of the division, and we do get nearly all information that comes through there. If we had any trouble, I'm sure we would have been told about it.

Q Do you have any idea how deep that you can efficiently pump, using this type of unit?

A Well, the boys that sell the equipment tell me that when you design rod strings and so on and so forth, they usually neglect the effect of the upper pump, or just design for the fluid hydrostatic to the lower pump, or design the rod string on that basis, and also design their surface pumping equipment on that basis. They tell me that even though you would think a hydrostatic head on the upper pump would add something to it, that a dynamometer result does not bear that out.

Q Then I gather that your answer is that you can go any depth you want to?

A Of course, you are limited some on rod strings, but we could go fairly deep.

Q By "fairly deep", what do you mean, six thousand?

A No, I think I stated previously we have those electro counted

7100, I would say we could go down to 8500, 9000 feet with one of these set-ups.

Q One last question. How do you propose to test the packer on this well?

A We can test the packer by running in the wire line equipment and running the bottom hole pressures on the two zones, separate the two zones before we install this pumping equipment. The only thing --

Q (Interrupting) Before you install the pumping equipment?

A Yes. What we will have will be the pressures of the two zones, so that we know they are not equal and that should test our packing, the packer seal in the Model "DA" production packer.

Q You test it under static conditions?

A Yes.

Q Normal bottom hole pressure?

A Yes, sir.

Q That difference in pressure you said was what?

A We had the one pressure 1711 on the Yates, which I think is a little high for that depth of production, but we did have a bottom hole pressure on our well 788 pounds, and that is quite a little difference right there.

Q I don't believe I noted what your lower completion pressure was?

A 788 pounds.

Q 788. Do you think that sufficient pressure differential

to properly test the packer?

A Yes, I think it is, we calculate, if that 1711 pounds is borne out by that Yates formation.

MR. UTZ: That's all I have.

MR. NUTTER: Any further questions of Mr. Motter? If not, he may be excused.

(Witness excused.)

MR. NUTTER: Does anyone have anything further they wish to offer in Case 1364? We will take the case under advisement, and recess the hearing until 1:00 o'clock.

(Recess.)

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C E R T I F I C A T E

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 20th day of January, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1959.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1364 heard by me on 1-7, 1958.

Examiner
New Mexico Oil Conservation Commission